University of Illinois
at Urbana-Champaign
College of Agriculture
Cooperative Extension Service
Circular 1224

Assessing Farmland In Illinois

CONTENTS

This circular was prepared by D.L. Chicoine, associate professor and Extension economist, and J.T. Scott, professor, Department of Agricultural Economics, University of Illinois at Urbana-Champaign. Material for the chapter "Illinois Soil Productivity Indexes" was contributed by R.A. Pope, former Extension agronomist, Department of Agronomy, University of Illinois at Urbana-Champaign. The authors would like to thank C.K. Barrow, Illinois Department of Revenue, for his contribution to the chapter "Administration of Farmland Assessments" and R. McKain, Illinois Farm Bureau, for his contribution to the chapter "Assessing a Farm Parcel."

Property taxes are the means by which most of the costs of local government are paid. Property taxes are based on the assumption that the value of one's land and buildings is a measure of one's ability to contribute to these costs. In Illinois, the assessment of the value of one's land and buildings is performed by township and county assessing officials in accordance with state laws and administrative guidelines.

The tax rate that is applied to the assessed value of a taxable property also is determined locally. The rate is defined as the amount of money needed from property taxes to pay for a local government's expenditures divided by the assessed value of all property within that government's boundaries. The level of property taxation is thus directly determined by the annual budget of the local government.

About five billion dollars of property tax revenues is spent annually in the state for fire and police protection, local roads and streets, public health, parks and recreation, mental health clinics, criminal justice, and, most importantly, local schools. About 60 cents of every dollar of property taxes collected in Illinois is spent for primary and secondary education.

Until the late 1970s, farmland in Illinois was assessed in the same manner that most property in Illinois still is—on the basis of its fair cash market valuation. With the passage of what is commonly called the Illinois Farmland Assessment Act in 1977, however, farmland assessments for property tax purposes began to move away from fair cash market valuation toward agricultural use valuation. Use-value assessments, unlike market-value assessments, recognize a difference between value in use and value in exchange. Because use-value assessments are generally lower than market-value assessments, they provide property tax relief to farm owners.

With the passage of the 1981 amendment (PA82-121) to the Farmland Assessment Act, a four-year phased-in program was established for use-value assessments. Illinois joined 44 other states with differential farmland assessment programs.

Under the 1981 amendment, farmland in Illinois is assumed to have a use-value equal to the present value of the future residual income accruing to the land from farm production. To assure uniformity as well as accuracy in assessments, the state annually calculates a use-value for each soil productivity index rating and asks for local input into these values.

The following section of this circular details the legal and administrative aspects of Illinois's approach to farmland use-value assessment. Because use-values are calculated for each soil productivity index rating, the second section gives some background on how the soil productivity indexes themselves are calculated. The last two sections of this circular demonstrate the methods used to calculate use-values and assess farmland. This circular thus should give interested readers a brief but substantive overview of the way farm property is assessed in Illinois.

ADMINISTRATION OF FARMLAND ASSESSMENTS

Division of Administrative Responsibilities

Local Assessing Officials

The assessment of all taxable property, including farmland, is the duty of local assessing officials. In commission counties, the county supervisor of assessments makes the primary assessments. In township counties, the township or multitownship assessors make the primary assessments, although the county supervisor of assessments is responsible for reviewing these values. However, in some township counties the county supervisor of assessments makes the primary assessments on farm parcels when the county has elected to centralize the process in order to provide greater equity throughout the county or to reduce costs.

In all counties, those responsible for assessing farmland base their assessments on the soil productivity index use-values provided by the Department of Revenue and on the plan of implementation generally developed by the county supervisor of assessments. Both the use-values and the plan must go through a local review process before they can actually be used by the assessors.

Illinois Department of Revenue

The Department of Revenue is responsible for calculating use-value assessment data and for certifying this data to each county on an annual basis. The department is also charged with evaluating farmland assessments to ensure that each county is in compliance with the farmland assessment law at the end of the four-year phase-in period. To perform this evaluation, the department computes, on a per-acre basis, the county-average assessed valuations for cropland and for all farmland.

In addition to its certification and evaluation responsibilities, the department issues guidelines on the proper implementation of the farmland assessment law. The intent of the guidelines is to produce equitable farmland assessments throughout Illinois within the statutory provisions of the farmland assessment law. The guidelines (presented on pages 7 and 8) define four major farmland uses—cropland, permanent pasture, other farmland, and wasteland—and detail suggested assessment procedures for each use. The guidelines also suggest how counties might adjust for factors such as slope, erosion, and flooding and how they might assess acreage in roads, lanes, windbreaks, streams, drainage ditches, ponds, and other alternate uses.

The Department of Revenue is further responsible for reviewing any alternative plans of implementation or use-values proposed by county farmland assessment review committees.

County Farmland Assessment Review Committees

Under the 1981 amendment to the farmland assessment law, a county farmland assessment review committee was set up in each Illinois county. Each committee is composed of five members, one of which is the county supervisor of assessments, who serves as chair. The second member is the chair of the county board of review or another board member appointed by that chair. The remaining three members are farmers from the county. Any farm owner or operator may serve as a farmer-member of the committee.

Each county farmland assessment review committee has four main responsibilities. One is to review the use-value data provided to the county by the Department of Revenue. If a committee feels that the certified use-values are not applicable to the county, it can develop alternatives thought to be more appropriate for conditions in the county. These alternatives, with appropriate supporting documentation, are presented to the department for review.

Another of the committee's responsibilities is to review the county plan for implementing farmland use-value assessments, which is generally developed by the county supervisor of assessments. If the committee feels that the proposed plan does not fulfill statutory intent, it can develop an alternative. This alternative must also be submitted to the Department of Revenue for review.

A third responsibility of the committee is to hold a public hearing. The purpose of the hearing is to receive public comment on the proposed use-value assessment data and plan of implementation. After this hearing, the committee decides either to accept the certified use-values and the county's plan of implementation or to develop alternatives to present to the Department of Revenue.

Finally, the committee is responsible for providing technical assistance to local assessing officials. This assistance may involve the eligibility of a particular parcel for assessment as farmland, the treatment of unique and uncommon factors or factors that negatively affect productivity, or any other technical matter with which officials need assistance.

County Boards of Review

Each county has a board of review that is responsible for evaluating all assessments, including farmland assessments, set by local assessing officials and for changing any assessment that it feels has been made improperly. The county board of review also hears appeals from individual land owners and makes adjustments to assessments where warranted. Under the 1981 amendment to the farmland assessment law, the board may make across-the-board adjustments in annual farmland assessments through the use of board of review factors.

Illinois Property Tax Appeal Board

Owners of individual parcels of property who are dissatisfied with the decision of their county board of review may appeal to the Illinois Property Tax Appeal Board. The appeal board also hears the complaints of any county farmland assessment review committee that is dissatisfied with the Department of Revenue's response to its proposed alternatives to the use-values or the local implementation plan. The appeal board's decisions on the use-values or plan are final and are not subject to administrative review by the courts.

Farmland Assessment Technical Advisory Board

Also created under the 1981 amendment was the Farmland Assessment Technical Advisory Board. This is a five-member advisory board appointed by the director of the Illinois Department of Revenue. The members are technical experts from the colleges and schools of agriculture of the state universities and representatives of state and federal agricultural agencies. The responsibilities of the board are to provide data annually to the Department of Revenue for use in the calculation of the agricultural use-values and to provide technical assistance to the department in the administration of farmland assessments. To this end, the board reviews all guidelines and materials issued by the department concerning the implementation of farmland use-value assessments.

Administrative Cycle

The 1981 amendment to the farmland assessment law establishes a preliminary review cycle that precedes the actual assessment, which occurs on January 1 of each year.

On or about May 1 prior to the assessment date, the Illinois Department of Revenue makes its annual certification of use-value assessment data and county-average assessments to all county supervisors of assessments.

On or before June 1 prior to the assessment date, the county supervisor of assessments presents the review committee with the state-certified values and the county's proposed plan of implementation for the upcoming assessment year. The committee then holds a public hearing.

By August 1 the review committee must either have elected to accept the proposed values and plan or have developed alternatives. Alternatives must be presented to the Department of Revenue for review by August 1.

The Department of Revenue must review the proposed alternatives and make a decision about their acceptability by September 1. If the county review committee is dissatisfied with the department's decision, it has until October 1 to appeal that decision to the Illinois Property Tax Appeal Board.

The appeal board must hold a hearing within thirty days of receipt of the formal appeal and render its decision within sixty days. If there are less than sixty days before the assessment date of January 1, the board must render a final decision no later than December 31.

Definition of Farm Parcel

Under the farmland assessment law, the farm parcel is divided into four separate parts in the process of assessment. Each part is assessed and valued in a different fashion.

Farm Homesite

The farm homesite is defined as that land on a farm parcel being used for residential purposes. The homesite is assessed as all other residential land in the county at 33⅓ percent of its fair cash market value as residential land. The market value would be whatever comparable rural residential land is selling for in the area. This part of the farm parcel assessment is subject to county board of review and state equalization factors.

Farm Residence

The farm residence is to be assessed as all other residential improvements in the county at 33⅓ percent of its market value as residential property. The market value would be whatever comparable rural residences are selling for in the area. This part of the farm parcel assessment also is subject to county board of review and state equalization factors.

Farm Buildings

Farm buildings are assessed at 33⅓ percent of their contributory value to the productivity of the farm. Contributory value considers the current use of the improvements and what that use adds to the overall productivity of the farming operation. This part of the farm parcel assessment is subject only to county board of review factors.

Farmland

Farmland in Illinois is assessed on the basis of the use-values provided by the Illinois Department of Revenue to each county. The use-values, determined for each soil productivity index, form the basis for valuation

of three types of farmland—cropland, permanent pasture, and other farmland—as they are defined in the Department of Revenue's guidelines (see below). Adjustments may be made in the application for factors that may detract from productivity. The farmland portion of a farm parcel assessment is subject only to county board of review factors.

ILLINOIS DEPARTMENT OF REVENUE GUIDELINES

Definitions of Land Use

- CROPLAND includes all land from which crops are harvested or hay was cut; all land in orchards, vineyards, and nursery and ornamental stock; land in rotational pasture and grazing land that could have been used for crops without additional improvements; land used for cover crops, legumes, and soil improvement grasses; land on which crops failed; land in cultivated summer fallow; and idle cropland. (If land falls into any one or more of these categories, it will be assessed as cropland.)
- PERMANENT PASTURE includes any pasture land that is not normally tilled except for renovating.
- OTHER FARMLAND includes land in ponds; woodland pasture; woodland including woodlots, timber tracts, cutover, and deforested land; and farm building lots other than homesites.
- WASTELAND includes land not falling into any of the above categories and which cannot be cultivated or pastured.

Assessment Procedures

- CROPLAND will be assessed in accordance with the equalized assessed value of its soil productivity index as certified by the department. Each year the department will supply a chart showing the equalized assessed value of cropland for each productivity index. Cropland with a productivity index below the lowest productivity index certified by the department shall be assessed according to the procedure under [Section V, page F4, *Illinois Real Property Appraisal Manual* (1982)].
- PERMANENT PASTURE will be assessed at $\frac{1}{3}$ of its debased productivity index equalized assessed value as cropland. In no case will the equalized assessed value of permanent pasture be below $\frac{1}{3}$ of the equalized assessed value per acre of cropland of the lowest productivity index certified by the department.
- OTHER FARMLAND will be assessed at $\frac{1}{6}$ of its debased productivity index equalized assessed value as cropland. In no case will the equalized assessed value of other farmland be below $\frac{1}{6}$ of the equalized assessed value per acre of cropland of the lowest productivity index certified by the department.
- WASTELAND will be assessed based on its contributory value. In many instances wasteland contributes to the productivity of other types of farmland. Some land may be more productive because wasteland provides a path for water to run off or a place for water to collect. In cases where wasteland has a contributory value, it will be assessed at $\frac{1}{6}$ of the value of the lowest productivity index of cropland certified by the department. When wasteland has no contributory value, a zero assessment is recommended.

(continued)

GUIDELINES, continued

Debasement Factors

- DEBASEMENTS FOR SLOPE AND EROSION. Adjustments to a productivity index for slope and erosion should be made using Table 3 on page F5 of the *Illinois Real Property Appraisal Manual* (1982) [reproduced on page 15 of this circular].
- DEBASEMENTS FOR FLOODING. The productivity index of land that is subject to flooding should be adjusted as described in Circular 1156 published by the University of Illinois, College of Agriculture, Cooperative Extension Service [also described on page 16 of this circular].
- DEBASEMENTS FOR PONDING. No adjustment for ponding will be made. Where ponding consistently produces a crop loss, then a flooding adjustment should be made. [See page 16 for an explanation.]
- DEBASEMENTS FOR FIELD SIZE AND SHAPE. At this time the department offers no guidelines for field size and shape adjustments.
- DEBASEMENTS FOR DROUGHTINESS. No adjustment for soil droughtiness will be made. [See page 16 for an explanation.]

Guidelines for Alternate Uses

- ROADS. Acreage in dedicated roads will be removed from the total acreage when calculating the weighted average productivity index, and no value will be assigned to acreage in roads. Exception: If a portion of the right-of-way is being put to a farm use, this portion should be assessed.
- CREEKS, STREAMS, RIVERS, AND DRAINAGE DITCHES. Acreage in creeks, streams, rivers, and drainage ditches will be removed from the total acreage when calculating the weighted average productivity index and should be assessed as wasteland.
- GRASS WATERWAYS AND WINDBREAKS. Acreage in grass waterways and windbreaks will be assessed as other farmland.
- PONDS. Ponds will be assessed as other farmland. Exception: If a pond is used as part of the homesite, it will be assessed with the homesite at 33⅓ percent of the market value. If the pond is used commercially, it will disqualify the parcel for farmland assessment.
- POWER LINES. No adjustment should be made.
- LANES AND NONDEDICATED ROADS. Acreage in lanes and nondedicated roads will be assessed as the adjacent land use. This could be as cropland, permanent pasture, other farmland, or wasteland.
- BORROW PITS. Borrow pits will be assessed as wasteland. If borrow pits are a part of the homesite or are being used commercially, the same comments made under ponds will apply to borrow pits.

ILLINOIS SOIL PRODUCTIVITY INDEXES

The agricultural use valuation of land for property tax purposes depends on the productivity of the soil. Soil productivity is essentially the capacity of a soil to supply the nutrient and water needs of a growing crop. The objective in indexing soil productivity is to provide a scale that can be used to compare the relative capacities of Illinois soils to produce the state's principal grain crops.

The capacity of a soil to supply a crop's needs is greatly influenced by management practices and the suitability of the particular crop to the specific growing conditions. To provide a rating scale on which all soils are treated equitably, therefore, Illinois soil productivity indexes take into account not only the inherent physical properties of the soil but also these other influencing factors.

Factors Considered in Illinois Soil Productivity Indexes

Soil Properties and Topography

The most basic influence on the ability of a soil to produce is its physical and chemical properties. These properties are the result of how and from what the soil was originally formed as well as how climate and time have worked on these parent materials.*

Soils are classified and mapped on the basis of the kind, thickness, and arrangement of horizons or layers, as well as on the basis of such properties as the color, texture, structure, reaction, consistence, and mineralogical and chemical composition of these horizons. In the classification process, soils are named for the town or geographic feature near where they are first identified.

By comparing the individual properties of the classified soils, one begins to be able to identify those soils with more potential to produce the state's principal grain crops. For example, the soil Muscatine, with its dark brown to black color, nearly level slope, thickness, and prairie-loess parentage, can be expected to have more potential than the soil O'Fallon, with its moderately sloping nature, acidic qualities, and brown and gray silty clay loam horizon.

---

*For an account of how Illinois soils were formed and from what materials, see *Soils of Illinois*, pp. 34-39, University of Illinois Agricultural Experiment Station Bulletin 725. This bulletin is available from your county Extension office or from Agricultural Publications, 47 Mumford Hall, University of Illinois, 1301 W. Gregory Drive, Urbana, IL 61801, (217-333-2548).

Crop Suitability

The potential of soils to produce depends, of course, on the crop being produced since crops vary considerably in their adaption to different climates and soil conditions. For example, oats, a cool-season crop, yield poorly in the warmer climate of southern Illinois, and soybeans are better able than corn to maintain yields in areas of marginally droughty soils. For these and similar reasons, the indexing system is based on each soil's potential to produce the four principal grain crops in Illinois—corn, soybeans, wheat, and oats.

Because these grain crops vary in importance from one part of the state to another, the soil productivity indexes also are weighted to reflect the relative acreage of each grain crop in the region where a particular soil occurs. For example, more weight is given to wheat in the productivity indexes of predominantly southern Illinois soils than in the indexes of soils predominantly found in central and northern Illinois. Similarly, less emphasis is put on oat yields in productivity indexes for predominantly southern Illinois soils and more emphasis in indexes for predominantly northern Illinois soils.

Level of Management

Crop yields on a particular soil under a given climate further depend on the level of management. A soil that consistently produces high yields when properly drained and fertilized and when close attention is given to weed and insect control will not produce well if these management inputs are inadequate or poorly timed. Because the effect of management is so great on crop yields, the level of management must be defined for measures of soil productivity to have any meaning.

The University of Illinois uses two management levels for rating Illinois soils. The basic management level includes the minimum inputs considered necessary for crop production to be feasible. Some drainage, for example, is required before crops can be grown on soils that naturally drain poorly. Some limestone must be applied to highly acidic soils. Some nitrogen, either from fertilizers, manure, or legumes, is needed for corn production. These minimal or basic requirements are far too low, however, for sustained high yields.

The high management level includes inputs that are near those required for maximum profit with current technology. Crop yields under the high management level also tend to increase as the management ability of Illinois farmers and the management inputs available to them improve.

Since productivity indexes are relative rather than absolute scales, it is more important that the same management level be used for soil comparisons than that the absolute yield levels be exact. Although yields

have tended to increase as management has improved, the relative differences between soils change very little. Thus, productivity indexes within a management scale are more stable measures of soil productivity than absolute yields, which fluctuate from year to year.

*Calculation of Productivity Indexes**

The actual data used to calculate the soil productivity index of a particular soil consist of (a) long-term, estimated, crop yields on that soil at a specified management level, (b) a base yield for each crop (used to convert estimated yields to a percentage basis), and (c) the proportions of the cropland acreage that are used for each crop in the area of the state where the soil occurs.

Several sources of information are used in establishing long-term, estimated, grain crop yields for each soil. These include long-term yield records from the Farm Business Farm Management (FBFM) program, long-term crop yields under specified management levels at the various University of Illinois agronomy research centers around the state, and average yields reported by the Illinois Cooperative Crop Reporting Service. Where data are not available for a particular soil, yield estimates are developed by comparing yields on closely related soils and making adjustments to reflect soil differences. The long-term crop yields used for each soil series under both basic and high levels of management can be found in Table 2 of Circular 1156.

The base yields used to convert yield estimates to a percentage basis are the average of the yields obtained under a basic level of management for several of the more productive soils in the state. These soils were selected because a large data base is available as a result of university experiments under specified levels of management. The average or base yields used for conversion purposes are as follows: corn, 103 bushels; soybeans, 33 bushels; wheat, 34 bushels; and oats, 66 bushels per acre.

The proportions of grain crop acreages used to weight the productivity indexes for the importance of each crop are based on figures supplied by the Illinois Cooperative Crop Reporting Service. The proportions used for northern Illinois are 55 percent for corn, 35 percent for soybeans, 6 percent for wheat, and 4 percent for oats. In southern Illinois, the proportions used for corn, soybeans, wheat, and oats are 35, 45, 20, and 0, respectively.

---

*For those interested in a more complete discussion of soil productivity indexes, Cooperative Extension Service Circular 1156, *Soil Productivity in Illinois*, can be requested from the county Extension office or by writing Agricultural Publications.

Shown below is a sample calculation of a soil productivity index for a northern Illinois Fayette soil under high management. Similar procedures are used for basic management, but the estimated yields are lower.

Line Number		Corn	Soybeans	Wheat	Oats
1	Estimated yield under high level of management, bushels per acre	129	39	53	73
2	Base yield (index = 100)	103	33	34	66
3	Relative yield (line 1 ÷ line 2 × 100)	125.2	118.2	155.9	110.6
4	Fraction of total grain crop acreage	0.55	0.35	0.06	0.04
5	Weighted relative yield (line 3 × line 4)	68.9	41.4	9.4	4.4
6	Productivity index (sum of line 5 data)		124.1		
	Rounded to the nearest multiple of 5 = 125				

The productivity indexes used in assessing farmland in Illinois are the average of the indexes calculated for each soil series under a basic and high level of management (see Table 1). For those interested in the indexes under both the basic and high levels for each soil, see Table 2 in Circular 1156.

Adjustments to Productivity Indexes

Soil productivity indexes calculated by the procedure above apply to soils on nearly level topography that are not eroded or subject to flooding. Because slope, erosion, or flooding will reduce soil productivity, the index must be adjusted where a soil is subject to slope, erosion, or flooding.

It is important that adjustments in productivity indexes for increasing degrees of slope and erosion correspond to the management level used in calculating the productivity index. It also is important to note the quality of the subsoil when making slope and erosion adjustments. The effects of increasing slope and erosion are more severe on soils with subsoils unfavorable for root development than on soils with subsoils high in permeability, water-holding capacity, and fertility. Table 2 gives the percentages by which one needs to adjust the soil productivity index for increasing degrees of slope and erosion on soils with the quality of subsoils indicated. The data used in determining these percentages considered basic and high levels of management; these percentages reflect the average of these two levels.

Table 1. Productivity Indexes (PI) for Average Level Management

Soil no.	PI	Soil no.	PI	Soil no.	PI	Soil no.	PI	Soil no.	PI
2	87	54	47	109	87	178	82	242	105
3	87	55	110	112	95	180	107	243	100
4	85	56	115	113	95	184	85	244	117
5	80	57	100	116	92	187	75	248	92
6*	55	59	127	119	87	188	95	249	107
7*	42	60	100	120	57	189	110	250	92
8	57	61	115	122*	67	191	97	252	112
12	77	62	110	125	110	192	92	253	60
13	82	67	110	127	105	194	80	256	85
14	80	68	127	128	102	197	117	257	112
15	87	69	112	130	97	198	127	259	97
16	85	70	112	131	85	199	120	261	70
17	100	71	82	132	100	200	92	262	87
18	100	72	97	134	95	201	90	264	72
19	85	73	117	136	82	204	97	265	90
21	92	74	117	137	82	205	82	266	85
22	87	75	105	138	112	206	100	268	110
23	82	76	115	141	87	208	92	271	82
24	100	77	125	142	120	210	100	272	100
25*	45	78	110	145	115	212	85	274	90
26	82	81	127	146	102	214*	87	275	127
27	95	82	105	147*	80	215	92	277	120
28	97	83	87	148	115	218	92	278	107
29	62	84	65	149	125	219	115	279	100
30	50	85	52	150	87	221	105	280	100
34	95	87	82	151	97	223	97	282	45
35	55	88	67	152	125	224	82	284	122
36	125	89	82	153	115	227	97	286	87
37	120	91*	90	154	130	228*	67	287	95
40	85	92	60	155*	67	229	70	288	102
41	130	93*	45	159	90	230	85	289	100
42	75	97	95	162	115	232	110	290	100
43	130	98	72	164	90	233	100	291	97
45	90	100	90	165	85	234	115	292	100
46	115	102	105	167	92	235	97	293	120
47	115	103	105	171	120	236	105	294	112
48	110	104	115	172	85	238	80	295	100
49	75	105	110	173*	72	239	105	296	105
50	112	107	120	175	82	240	97	297	105
53	65	108	85	176	110	241*	37	298	90

Source: Illinois Department of Revenue, *Illinois Real Property Appraisal Manual,* Springfield, Illinois, December, 1982, page F7.

NOTE: For a list of soil names and their corresponding number, see Appendix C.

*Indicates unfavorable subsoil.

Table 1—*Continued*

Soil no.	PI	Soil no.	PI	Soil no.	PI	Soil no.	PI	Soil no.	PI
300	107	365	92	452	102	556*	77	691	45
301*	80	369	125	453	102	560*	62	696	90
302	105	370	85	454	107	561	70	697	105
304	80	375	112	456	97	562	100	698	97
306	120	379	90	457	65	563	77	706	70
307	95	380	67	460	82	564	90	723	100
308	100	382	95	461	90	565	85	727	85
309*	50	386	115	462	85	567	100	728	95
310	90	387	105	463	82	568	57	731	90
311	57	388	102	465	92	570	92	740	120
312	77	389*	40	467*	72	572	95	741	55
314	70	390*	77	469	90	574	85	742	87
315*	62	393*	67	470	80	576	75	743	90
316	22	394	112	471*	30	578	95	745*	90
317	92	397*	42	472	75	581*	60	746	87
318*	75	398	117	474	65	583	92	752	85
320*	75	400	107	475	90	584*	50	753	82
321	100	402	120	481	127	585	77	761*	50
322	97	404	100	482	92	587	112	763	107
323*	72	410	82	484	125	589	90	764	82
324	90	411	95	490	120	590	95	765	82
325	87	412	110	493	97	594	115	768	62
326	92	413	67	494	97	597	117	769*	72
327	82	414	102	495	110	598	57	771	85
329	102	415	105	496	102	599	40	772	95
330	100	416	105	497	102	600	120	774	80
331	112	417*	62	501	72	603	115	776	112
332	72	418*	72	503	85	605*	45	777	77
333	107	419	97	504	40	606	37	779	55
334	100	420	90	505*	52	609	117	780	82
335	80	422	82	506	90	617	105	781	97
337	87	424	117	508	105	619	97	782	105
338*	70	425*	30	509	75	620*	62	783	72
339*	50	426	77	511*	45	628	65	786*	55
340*	65	427	80	513	75	633	95	787	87
342	97	428	117	516	87	647	95	791	110
343	102	429	87	524	90	656	100	792	117
344	105	430	117	531	87	660*	57	903	100
346	85	431	107	537*	95	661	97	940	72
347	105	435	107	546	87	665	75	955*	30
348	105	440	110	547	80	673	80	956	67
353	110	442	115	549*	82	682	105	956*	47
354	60	443	107	551	45	683	127	961	60
361	82	448	90	554	87	684	117	977	30
363	95	451	127	555	82	685	90		

Table 2. Slope and Erosion Adjustment Factors (%)

Slope	Favorable subsoil			Unfavorable subsoil		
	Uneroded	Moderate erosion	Severe erosion	Uneroded	Moderate erosion	Severe erosion
0	100	98	89	100	94	79
2	100	96	87	100	92	77
4	99	95	86	98	90	75
6	98	93	85	96	89	74
8	96	92	83	94	87	72
10	95	90	82	93	85	70
12	93	89	80	90	83	68
14	91	86	77	88	81	66
16	88	84	75	86	78	63
18	86	81	73	83	76	61
20	83	78	69	80	72	57
22	80	75	67	77	69	55
24	77	72	63	74	65	51
26	73	68	60	70	62	48
28	70	64	57	67	59	43
30	66	60	52	62	56	39
32	61	56	47	58	50	35
34	56	52	43	54	47	32
36	53	49	41	50	43	29
38	51	46	37	48	40	27
40	49	44	36	46	38	25
42	48	43	35	45	37	23
44	47	42	34	44	37	22
46	46	42	34	42	36	22
48	46	42	33	42	36	

Source: Illinois Department of Revenue, *Illinois Real Property Appraisal Manual*, Springfield, Illinois, December, 1982, page F8.

SLOPE CLASSES: Slope classes are designated on soil maps by alphabetical letters and represent a range of slopes: **A** = 0-2% slope; **B** = 2-4%; **C** = 4-7%; **D** = 7-12%; **E** = 12-18%; **F** = 18-50%. Because the classes represent ranges, the Department of Revenue recommends using the following central points for each alphabetical designation: **A** = 0%. **B** = 4%. **C** = 6%. **D** = 10%. **E** = 16%. **F** = 26%. However, please note that the ranges comprising each class may vary with the publication and the date mapped. Check the ranges used in the map you are consulting. If they are different from those above, choose a central point close to the midpoint of the range used in your map.

EROSION CLASSES: 1 = uneroded. 2 = moderate. 3 = severe.

Adjustments in soil productivity indexes for flooding caused by stream overflow also are important, but the effects of flooding on a particular soil depend on stream and watershed characteristics and cannot be determined without knowledge of the flooding history of the stream in a particular location. For example, if flooding in a valley has caused three years of crop failure in the past ten years, estimated yields and productivity indexes for the bottomland soil should be reduced by 30 percent from those used for the same soil that is protected from flooding. However, if flooding in the spring consistently prevents corn planting but permits a late-seeded soybean crop in most years, the productivity index should be reduced, but some consideration also should be given to the fact that a soybean crop at reduced yields due to late planting can be harvested.

Ponding of water in depressional areas of upland soils can be a problem. However, ponding and the effects of ponding over a span of several seasons is considered in the development of soil productivity indexes through the assumptions made about management and through the long-term yields used for poorly drained soils. Therefore, except in special cases where ponding is induced by man-made obstructions, where artificial drainage is not used because of unsuitable outlets, or where ponding consistently produces a crop loss, no special adjustment for ponding on upland depressions is necessary.

Drought will severely depress yields in a given year. However, the frequency of drought over a span of ten or more years is included in the long-term yield estimates used in productivity index calculations. The inclusion of some years of drought stress in the indexes accounts in part for the claims of many farmers that the long-term yield estimates are low compared with their actual yields. Because the risk of drought is considered in the yield estimates for each soil, no special adjustment for drought is suggested.

VALUATION OF FARMLAND

Calculation of Agricultural Use-Values

The 1981 amendment to the Farmland Assessment Act prescribes that the use-value of farmland for property tax purposes be determined using a residual income capitalization method (sometimes called the capitalized net income method).

In an income capitalization method, use-values are based on the present value of the residual income that will accrue to the land in the future from farm production. Residual income is the gross income received from the sale of crops less the variable and nonland fixed costs of producing the crops, and the income method assumes that this residual income will continue to be earned year after year. The present value of this yearly income into perpetuity is determined through a capitalization procedure. This procedure is symbolized by the following equation:

$$\text{Use-value} = \frac{I}{R - S}$$

where
I = residual income,
R = the capitalization rate (the nominal opportunity cost of capital for farmland purchases adjusted for local taxes),
S = the expected nominal rate of growth in residual income.

As this equation suggests, the agricultural use-value will increase as residual income increases and will decrease as the capitalization rate increases.

The 1981 amendment to the Farmland Assessment Act defines the factors that go into the income capitalization method and provides methods of measuring them. The amendment specifies that the Illinois Department of Revenue calculate residual income for each average management soil productivity index by subtracting the most recent five-year-average nonland production costs from the most recent five-year-average gross income. The amendment also defines the capitalization rate as the average of the Federal Land Bank's farmland mortgage interest rate for the same five-year period used in estimating residual income.* The expected growth rate in income is implicitly defined as zero in the amendment.

*Market capitalization rates historically fluctuate from 3 to 4 percent, which is generally less than the Federal Land Bank's rate. There is some precedent for using the Federal Land Bank's rate in the determination of agricultural use-values. This five-year rate is authorized for use to compute use-values of farmland for federal estate tax purposes.

As detailed in the amendment, the gross income is to be calculated using (1) five-year-average prices received by Illinois farmers for corn, soybeans, wheat, and oats, as reported by the Illinois Crop Reporting Service,* (2) yields for each soil series (these are based on yield equations and the yields used to calculate soil productivity indexes),† and (3) crop rotations actually used by Illinois farmers for each soil series over a five-year period.

The amendment specifies that the nonland production costs be provided by the College of Agriculture of the University of Illinois. These costs are based on estimates of actual production costs incurred by Illinois farmers and include variable and fixed costs plus returns to management, family labor, and nonland capital. Reflecting differences in soil productivity and associated average cropping patterns, the nonland costs also vary by soil productivity index.

The crop prices, crop rotations, nonland production costs, and Federal Land Bank interest rates are those of the most recent five-year period for which complete data are available. Thus, 1983 use-values and assessments were based on data averaged over the 1977 to 1981 period, and 1984 values on data averaged over the 1978 to 1982 period. Because of the time lag involved, farmland use-values and assessments may not exactly reflect the current economic conditions of agriculture in Illinois.

The following crop prices and capitalization rates have been used in the past several years in computing agricultural use-values:

Commodity	1982 values	1983 values	1984 values
	Crop prices ($ per bushel)		
Corn	2.39	2.48	2.55
Soybeans	6.53	6.81	6.62
Wheat	3.17	3.34	3.52
Oats	1.41	1.52	1.64
	Average interest rates		
	9.77%	10.37%	11.71%

Crop rotations as a percentage, per-acre nonland production costs averaged over 1978 to 1982, and crop yields for some selected average management soil productivity indexes (PI) are listed at the top of the next page as illustrations. These data are provided each year to the

*See *Illinois Agricultural Statistics: Annual Summary*, various years, Illinois Crop Reporting Service, Springfield, Illinois.

†See Circular 1156, especially Figure 3 on page 6.

Department of Revenue by the Farmland Assessment Technical Advisory Board as specified in the amendment.

Average management PI	Corn		Soybeans		Wheat		Oats		1984 nonland production costs
	yield	%	yield	%	yield	%	yield	%	
60	76	28	26	53	34	18	47	1	$163.30
80	101	37	34	46	43	16	60	1	206.76
100	123	61	38	38	53	<1	73	<1	236.46

A computation of the agricultural use-value for an average management soil productivity rating of 100 follows as an example of the procedure. Per-acre gross income for that rating is determined by first multiplying the per-acre yields for each crop (corn, soybeans, wheat, and oats) by each crop's average price and then by weighting the results by the respective crop rotation percentage. The weighting procedure yields the relative contribution of each crop to the gross income of land containing soils of this quality. Summing the relative contributions of the four crops provides an estimate of the per-acre gross income. The steps in this procedure for the 1984 assessment year are shown below:

Crop	Yield (bu/A)	X	Price ($/bu)	X	Crop mix*	=	Contribution* ($/A)
Corn	123	×	2.55	×	0.61	=	191
Soybeans	38	×	6.62	×	0.38	=	95
Wheat	53	×	3.52	×	0.01	=	2
Oats	73	×	1.64	×	0.01	=	1
					Total gross income		289

*Values are rounded.

Subtracting the per-acre nonland production costs of $236.46 from the gross income yields a residual land income estimate of $52.54 per acre. The 1984 use-value of land with soils that have an index of 100 is then found by dividing the residual income by the Federal Land Bank's five-year average mortgage interest rate of 11.71%. This division results in an estimated 1984 agricultural use-value of about $449 per acre for soils with average management indexes of 100. The land's assessed value, however, is 33⅓ percent of the agricultural use-value, or $150 per acre in this example. These calculations can be summarized as:

$$\text{Use-value} = \frac{\text{residual income}}{\text{interest rate}} = \frac{\$52.54}{0.1171} = \$449 \text{ per acre}$$

$$\text{Assessed value} = 0.33 \times \$449 = \$150 \text{ per acre}$$

The Department of Revenue computes the per-acre assessed value of cropland in the same manner for each average management soil productivity index. These computations assume a 0 to 2 percent slope and uneroded conditions. The department certifies this value, as well as related data, to local assessing officials for use in the local assessment of individual farm parcels (see Table 3 for the certified 1984 cropland use-value assessment data).

Calculation of County-Average Assessed Values

The Illinois Department of Revenue also is required to compute annually, for each county, the average assessed value for cropland and for all farmland. The average values are based on each county's soil characteristics and farmland uses. The county-average assessed values are used by the state as benchmarks in evaluating the local application of farmland use-value assessments. This oversight function is required because some local governments overlap county boundaries and because of the state school-aid formula.

To compute each county's benchmark value, the Department of Revenue first estimates the average value of each farmland use category in the county using the appropriate soil productivity index assessed value and land use assessment level (i.e., cropland, permanent pasture, and other farmland). The department then weights the value of each category by the percentage of the county's farmland in that category.

The major shortcoming in this procedure is the lack of adequate data on the acres of cropland, permanent pasture, and other farmland in each county for each soil productivity index. As a result, the department had to allocate the acreages of each of the county's soils to one of the use categories. This allocation remains critical in the annual establishment of county-average farmland assessment values.

The soil data used in the allocation came from Bulletin 735, *Soil Type Acreages for Illinois,* published by the Agricultural Experiment Station, University of Illinois. The acreages of each soil type were allocated to one of two categories based on an evaluation of the properties of each soil type (the procedure is illustrated in Figure 1). The two categories were cropland and noncropland, and the properties considered included soil wetness, the favorability of subsoils, slope and erosion characteristics, and soil productivity indexes. For example, areas of relatively flat land with dry uneroded soils that had favorable subsoils and an average management soil productivity index of 57.5 or more were classed as cropland. On the other hand, all areas with wet soils were classed as noncropland.

Table 3. 1984 Cropland Use-Value Assessment Data

Average management soil productivity index	(1) Gross income	(2) Production costs	(3) Net income (column 1 - column 2)	(4) Proposed agricultural economic value	(5) Equalized assessed value (33⅓ % of column 4)
			(per acre)		
60	$167.52	$163.30	$4.22	$36.04	$12
61	170.49	165.93	4.56	38.97	13
62	173.46	168.66	4.80	41.01	14
63	176.44	171.19	5.25	44.82	15
64	179.41	173.82	5.59	47.76	16
65	182.38	176.44	5.94	50.70	17
66	185.35	179.07	6.28	53.64	18
67	188.32	181.69	6.63	56.58	19
68	191.29	184.32	6.97	59.52	20
69	194.27	186.96	7.31	62.43	21
70	197.24	189.59	7.65	65.37	22
71	200.21	192.21	8.00	68.32	23
72	203.27	193.83	9.44	80.61	27
73	206.33	195.45	10.88	92.91	31
74	209.40	197.07	12.33	105.29	35
75	212.46	198.69	13.77	117.59	39
76	215.52	200.31	15.21	129.89	43
77	218.58	201.93	16.65	142.19	47
78	221.64	203.55	18.09	154.48	52
79	224.71	205.17	19.54	166.87	56
80	227.76	206.76	20.97	179.08	60
81	230.83	208.41	22.42	191.46	64
82	233.89	210.03	23.86	203.76	68
83	236.95	211.65	25.30	216.05	72
84	240.02	213.26	26.75	228.44	76
85	243.08	214.89	28.19	240.73	80
86	246.14	216.51	29.63	253.03	84
87	249.20	218.13	31.07	265.33	88
88	252.27	219.74	32.52	277.71	93
89	255.33	221.36	33.96	289.50	97
90	258.38	222.99	35.39	302.22	101
91	261.45	224.61	36.84	314.60	105
92	264.51	226.22	38.28	326.90	109

(continued on next page)

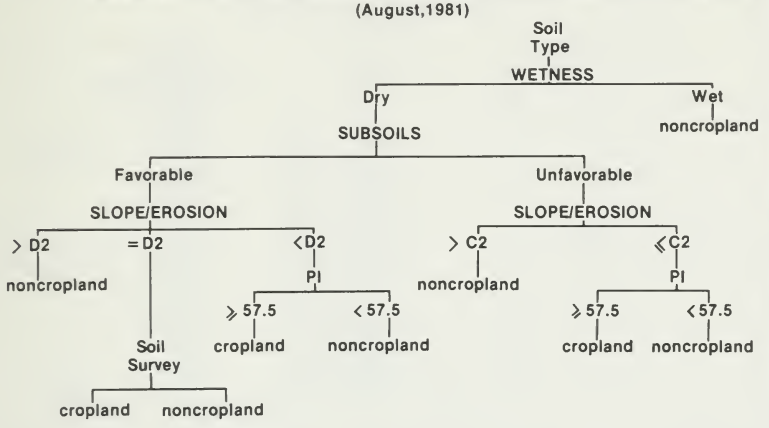
Source: Illinois Department of Revenue. The department certifies new cropland assessment data each year.

NOTE: If the average management soil productivity index for cropland is below 60, see the 1982 *Illinois Real Property Appraisal Manual*, page F4, for instructions on how to assess the acreage of that particular soil.

Table 3 —*Continued*

Average management soil productivity index	(1) Gross income	(2) Production costs	(3) Net income (column 1 - column 2)	(4) Proposed agricultural economic value	(5) Equalized assessed value (33⅓ % of column 4)
			(per acre)		
93	$267.58	$227.84	$ 39.43	$336.72	$112
94	270.64	229.46	41.17	351.58	117
95	273.69	231.09	42.60	363.79	121
96	276.76	232.70	44.06	376.26	125
97	279.81	234.32	45.49	388.47	130
98	282.89	235.38	47.50	405.64	135
99	285.95	235.93	50.02	427.16	142
100	289.01	236.46	52.55	448.76	150
101	292.07	236.98	55.08	470.37	157
102	295.13	237.49	57.63	492.14	164
103	298.20	237.99	60.20	514.09	171
104	301.26	238.49	62.77	536.04	179
105	304.32	238.97	65.35	558.07	186
106	307.38	239.45	67.93	580.10	193
107	310.45	239.91	70.54	602.39	201
108	313.51	240.36	73.14	624.59	208
109	316.57	240.81	75.76	646.97	216
110	319.63	241.25	78.38	669.34	223
111	322.69	241.68	81.00	691.72	231
112	325.76	242.10	83.65	713.92	238
113	328.82	242.52	86.29	736.89	246
114	331.88	242.94	88.94	759.52	253
115	334.94	243.33	91.60	782.24	261
116	338.00	243.45	94.54	807.34	269
117	341.07	243.55	97.51	832.71	278
118	344.13	243.65	100.47	857.98	286
119	347.19	243.75	103.43	883.26	294
120	350.25	243.85	106.39	908.54	303
121	353.31	243.95	109.35	933.82	311
122	356.38	244.05	112.32	959.18	320
123	359.44	244.16	115.28	984.46	328
124	362.50	244.26	118.30	1010.24	337
125	365.56	244.36	121.20	1035.01	345
126	368.63	244.46	124.17	1060.37	354
127	371.69	244.56	127.13	1085.65	362
128	374.75	244.66	130.09	1110.93	370
129	377.81	244.76	133.05	1136.21	379
130	380.87	244.86	136.01	1161.49	387

Figure 1. Decision Chart for Determining Cropland/Noncropland Soil Uses
Prepared by Property Tax Administration Bureau, Illinois Department of Revenue
(August,1981)



Once the soils had been classified as cropland or noncropland, the department summed up a county's acreages of first cropland and then noncropland across eleven ranges of average management soil productivity indexes. The eleven ranges used are as follows:

0 — 37.4
37.5 — 47.4
47.5 — 57.4
57.5 — 67.4
67.5 — 77.4
77.5 — 87.4
87.5 — 97.4
97.5 — 107.4
107.5 — 117.4
117.5 — 127.4
127.5 — 130.0

The acreages in each of these ranges were then divided by the county's total cropland or noncropland acreage to determine their percent contribution. Using *U.S. Census of Agriculture* data, the department also separated the noncropland acreage total into acres of permanent pasture and acres of other farmland.

Using these allocated acreages of cropland, permanent pasture, and other farmland, the Department of Revenue annually estimates the average value of cropland and all farmland in each county. However, because the allocated acreages are distributed across ranges of average management soil productivity indexes, the department uses an assessed

value that represents the midpoint of each of the eleven ranges. For the 1984 assessment year, for example, the values used were:

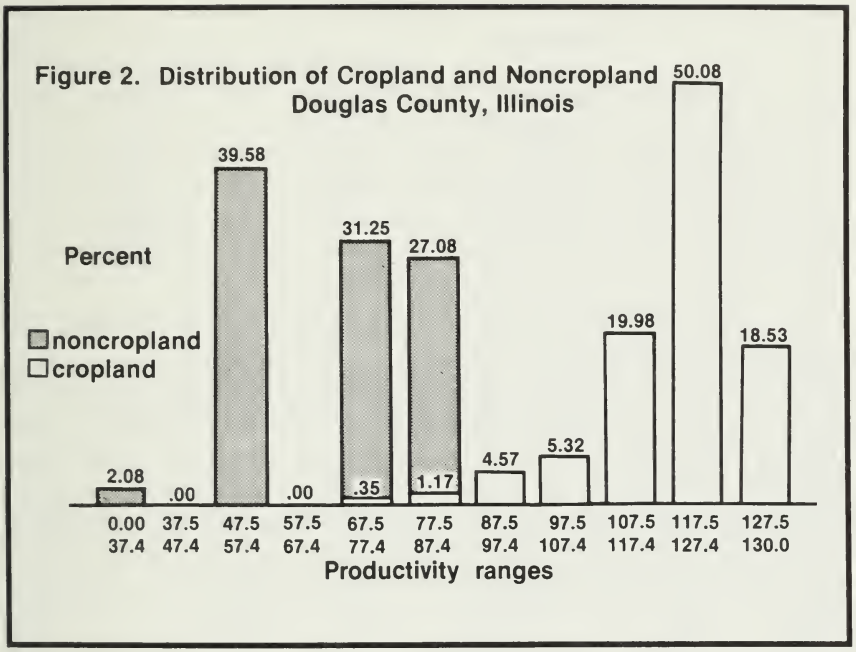
Soil productivity ranges	Midpoint of the ranges	1984 assessed value
0 — 37.4	18.7	12
37.5 — 47.4	42.5	12
47.5 — 57.4	52.5	12
57.5 — 67.4	62.5	14
67.5 — 77.4	72.5	29
77.5 — 87.4	82.5	70
87.5 — 97.4	92.5	111
97.5 — 107.4	102.5	168
107.5 — 117.4	112.5	242
117.5 — 127.4	122.5	324
127.5 — 130.0	128.8	377

The assessed values for the midpoint of the three lowest ranges are the same because the 1981 amendment puts a floor under the assessment of lower quality soils. That floor is the value for the lowest soil productivity index certified by the Department of Revenue. For 1984 that value is $12 (Table 3); therefore, the three lower ranges have an assessed value of $12 for 1984.

Perhaps the best explanation of the procedure described above would be an example. Therefore, the county-average cropland and all farmland assessed values for 1984 are computed below for Douglas County.

Douglas County's cropland acreage is distributed across seven of the eleven ranges of average management soil productivity indexes, and its noncropland acreage across four of the eleven ranges (Figure 2). The contribution of the cropland acreage included in each range to the county-average cropland assessed valuation is computed as follows:

Range	Proportion of cropland	X	1984 per-acre value ($)	=	Contribution ($/acre)
67.5 — 77.4	0.0035	×	29	=	0.10
77.5 — 87.4	0.0117	×	70	=	0.82
87.5 — 97.4	0.0457	×	111	=	5.07
97.5 — 107.4	0.0532	×	168	=	8.94
107.5 — 117.4	0.1998	×	242	=	48.35
117.5 — 127.4	0.5008	×	324	=	162.26
127.5 — 130.0	0.1853	×	377	=	69.86
				Total	295.40



For example, in Douglas County, the 19.98 percent of cropland with soils rated between 107.5 and 117.4 contributed $48.35 to the 1984 county-average cropland assessed value. Similarly, the 50.08 percent of cropland with soils rated between 117.5 and 127.4 contributed $162.26 to the 1984 county-average cropland value.

The sum of the contributions from the cropland in the seven productivity index ranges is the county-average assessed value for cropland.* In the case of Douglas County, this average is $295 per acre for 1984.

In a similar fashion, the contribution of the acres of noncropland in each soil productivity index range are computed and summed. For Douglas County these computations, shown at the top of the next page, are based on the distributions shown in Figure 2.

*The actual per-acre, county-average assessed value may be slightly lower after assessment than the value precalculated by the state due to adjustments for flooding.

Range	Proportion of non-cropland	X	1984 per-acre value ($)	=	Contribution ($/acre)
0 — 37.4	0.0208	×	12	=	0.25
47.5 — 57.4	0.3958	×	12	=	4.75
67.5 — 77.4	0.3125	×	29	=	9.06
77.5 — 87.4	0.2708	×	70	=	18.96
				Total	33.02

The $33.02 per acre in the example farm provides the basis for estimating the contribution of land in permanent pasture and in other farmland to the Douglas County average assessed value for all farmland. Recall that the assessment level for permanent pasture is one third the value of comparably productive cropland and that the level for other farmland is one sixth the value of comparably productive cropland. Applying these assessment levels to Douglas County yields an estimated average assessment for permanent pasture of $\frac{1}{3} \times \$33.02$ or $11.00 and an estimated average assessment for other farmland of $\frac{1}{6} \times \$33.02$ or $5.50.

The 1984 county-average assessments for the three farmland uses in Douglas County can thus be summarized as:

Land use	County-average assessment ($ per acre)	Total farmland (%)
Cropland	295.40	98.16
Permanent pasture	11.00	0.48
Other farmland	5.50	1.36

The county-average assessed value for all farmland is the sum of the individual land use assessments weighted by the proportion of total farmland represented by that land use. For Douglas County this procedure is:

Land use	County-average assessment ($ per acre)	X	Percent	=	Contribution ($ per acre)
Cropland	295.40	×	0.9816	=	289.96
Permanent pasture	11.00	×	0.0048	=	0.05
Other farmland	5.50	×	0.0136	=	0.07
				Total	290.08

The 1984 certified average assessment for all farmland in Douglas County is rounded to $290 per acre.

In a similar fashion the average assessments for cropland and all farmland are computed annually for all Illinois counties (see Table 4 for the 1984 county-average assessed values). As has been demonstrated in this section, soil and farmland use data for each county play a central role in establishing these farmland assessment benchmarks. Better land-use soil data from the county review committees would improve the accuracy of county-average farmland assessed values and contribute to the equity of farmland assessments across Illinois counties.

Table 4. 1984 Certification of Proposed Average Equalized Assessed Value (EAV) Per Acre of Cropland and All Farmland

County	Average EAV, cropland	Average EAV, all farmland	County	Average EAV, cropland	Average EAV, all farmland
Adams	$201	$131	Edwards	$ 90	$ 75
Alexander	98	82	Effingham	84	72
Bond	102	73	Fayette	109	92
Boone	179	172	Ford	214	201
Brown	176	109	Franklin	62	50
Bureau	268	231	Fulton	208	148
Calhoun	179	71	Gallatin	158	139
Carroll	235	186	Greene	238	175
Cass	211	143	Grundy	229	223
Champaign	293	279	Hamilton	72	59
Christian	238	225	Hancock	226	169
Clark	107	93	Hardin	95	31
Clay	76	68	Henderson	241	180
Clinton	93	76	Henry	233	207
Coles	260	233	Iroquois	190	183
Cook	148	134	Jackson	76	45
Crawford	101	88	Jasper	99	84
Cumberland	131	117	Jefferson	61	48
DeKalb	297	276	Jersey	190	129
DeWitt	306	289	JoDaviess	144	90
Douglas	295	290	Johnson	72	27
DuPage	186	176	Kane	232	219
Edgar	281	233	Kankakee	166	156

(continued on next page)

Source: Illinois Department of Revenue. The department certifies new equalized assessed values to each county each year.

Table 4—*Continued*

County	Average EAV, cropland	Average EAV, all farmland	County	Average EAV, cropland	Average EAV, all farmland
Kendall	$232	$227	Pike	$198	$143
Knox	258	200	Pope	93	41
Lake	151	141	Pulaski	89	65
LaSalle	262	246	Putnam	240	195
Lawrence	120	106	Randolph	99	71
Lee	248	235	Richland	72	63
Livingston	222	217	Rock Island	225	162
Logan	297	291	St. Clair	142	110
McDonough	309	277	Saline	89	62
McHenry	178	165	Sangamon	293	269
McLean	297	292	Schuyler	189	127
Macon	317	307	Scott	201	159
Macoupin	211	168	Shelby	178	159
Madison	169	135	Stark	284	247
Marion	69	55	Stephenson	209	185
Marshall	253	219	Tazewell	255	227
Mason	132	107	Union	123	68
Massac	95	64	Vermilion	240	225
Menard	263	224	Wabash	160	146
Mercer	270	209	Warren	310	276
Monroe	120	78	Washington	74	60
Montgomery	167	138	Wayne	76	66
Morgan	270	213	White	126	103
Moultrie	312	302	Whiteside	192	175
Ogle	220	181	Will	170	156
Peoria	223	164	Williamson	64	39
Perry	61	50	Winnebago	168	137
Piatt	309	298	Woodford	275	235

ASSESSING A FARM PARCEL

The assessing of land in a farm parcel according to its agricultural use-value consists of three major steps. First, the local assessing official determines the acreages of the major farmland uses. These land uses include cropland, permanent pasture, other farmland, wasteland, dedicated roads, building sites, etc. Second, based on the soils in the tract, the assessing official calculates a weighted or average management soil productivity index for each major land use. Third, the local official values or assesses each land use according to its soil productivity index and the guidelines furnished by the Illinois Department of Revenue.

Maps Used in the Assessment Process

The basic tools required to carry out these steps include aerial base tax maps and the county soil survey maps prepared by the USDA Soil Conservation Service (SCS) in cooperation with the Illinois Agricultural Experiment Station.

Aerial base tax maps are developed from aerial photographs that provide a complete visual record of all real property, including property boundaries. By using aerial maps with an appropriate scale, the assessing official can identify the required characteristics of each farm parcel. The Illinois Department of Revenue recommends that map scales of 1 inch to 400 feet or 1 inch to 600 feet be used for rural areas.

The SCS maps are used because they provide the soil detail needed for the assessment of individual tracts or parcels of farmland in a county. The SCS maps include the location of farmsteads, field borders, roads, woodland, ponds, and other features that aid in plotting soil boundaries accurately.

Even more importantly for assessment purposes, the four-inch-per mile soil maps delineate the types of soil in each farm parcel. The soil series is indicated by a number code.

The SCS maps also give the slope range and the degree of erosion (or amount of original surface soil remaining) for each soil series shown. Slope is designated by a letter, and erosion by a number. For example, if a portion of the map has the symbol 36C2, the soil series in that area is Tama silt loam (36), the slope is 4 to 7 percent (C), and erosion is moderate (2).* When the slope is less than two percent and the soil has no

*As mentioned in Table 2, the ranges comprising each slope class (A,B,C,D,E, and F) vary with survey publications and date mapped. Check the ranges used in your map.

evidence of erosion, the slope and erosion designations are usually omitted. Thus, 152 on a soil map designates uneroded Drummer silty clay loam with a 0 to 2 percent slope.

The smallest delineation that can be shown on a four-inch-per-mile soil map is about two acres. As a result, differences in very small areas of soils or other soil peculiarities can only be detailed in the survey descriptions that accompany each map. The information in these descriptions must be taken into account when weighting soil productivity indexes.*

At present, the Soil Conservation Service has published detailed soil surveys of 46 of the 102 counties in Illinois and is ready to publish or is completing surveys for 32 additional counties (Figure 3).

In the assessment process, the detailed SCS soil survey maps are overlaid on the aerial maps to provide an inventory of the soil series and the slope and erosion characteristics of each farm parcel (see Figure 4). If a county does not have detailed SCS soil surveys, additional steps are required to determine the amount and type of soil in the farm tract. These additional steps are provided in Appendix B.

Presented below is an example application of the procedure for assessing the farmland portion of a farm parcel.† A worksheet outlining the assessment procedure can be found in Appendix A. The worksheet organizes the steps in the assessment procedure in a logical sequence and provides space to carry out needed computations.** The worksheet is followed in developing this example farm parcel assessment. The example is based on the 320-acre farm presented in Figure 4.

---

*For example, if two or more soils occur together in a pattern that is too intricate for the individual soils to be delineated at the scale being used, an adjusted productivity index must be calculated for use in step two of the assessment procedure. When the percentage that each soil contributes to the acreage in question is known, the following method of adjusting is used: the productivity index of each soil is multiplied by its percent contribution, and the resulting numbers are added together. This total is the adjusted productivity index. If the percentage of each soil type is not known, the productivity indexes for the individual soil types are simply averaged to produce an index for the acreage.

†Those interested in additional details should consult the Illinois Department of Revenue's *Illinois Real Property Appraisal Manual*, Section F, "The Assessment of Rural Property."

**The worksheet is not designed to replace the property tax record cards currently used in individual Illinois counties for assessing real property. It is intended to complement the official data enrolled on property tax record cards.

Figure 3. Status of Soil Surveys
(October, 1983)

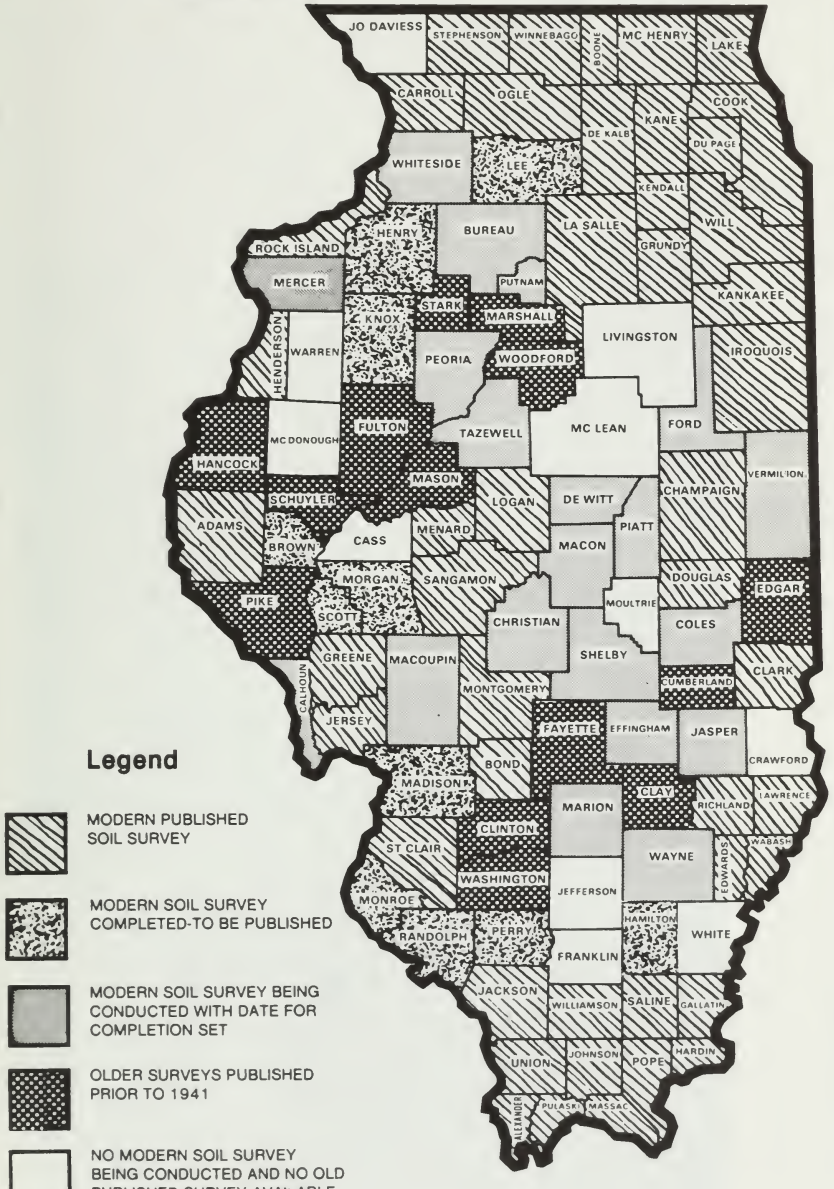
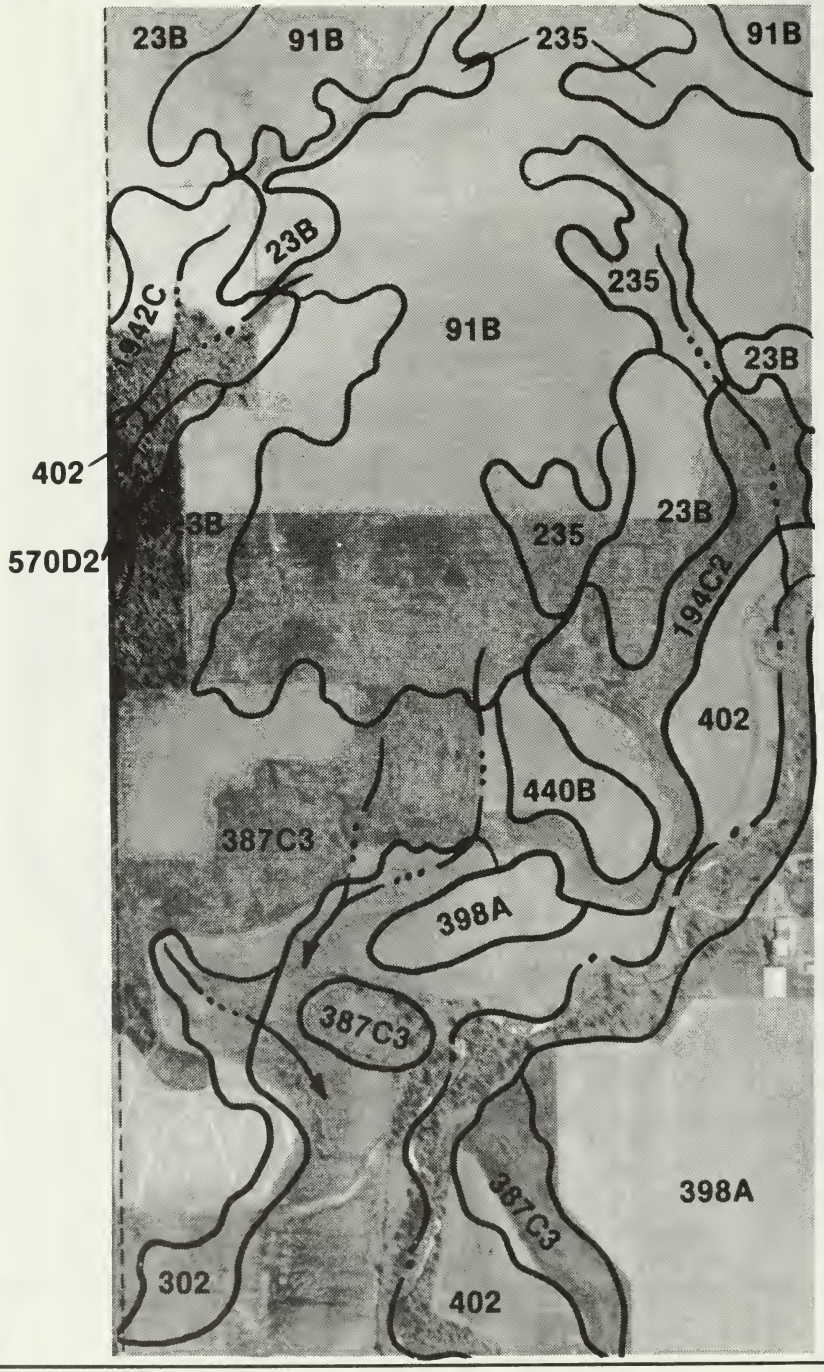


Figure 4. Aerial Base Tax Map with Soils Overlay



Step One: Determining Land Use

The first step is to determine the acres of land in alternative uses. Lines 6A through 6H on the worksheet identify the noncropland uses. (Farm tract identification data and other assessment information are recorded on lines 1 through 5.) The total noncropland acreage is entered on line 6I. The acres of land use and acres of each soil making up each land use are measured from the aerial base map using a planimeter, a grid, or an electronic area calculator.

From the aerial map (Figure 4), the acreage of each noncropland use in the example farm was determined and recorded on the example worksheet (below). Of this noncropland acreage of 46.48 acres (line 6I), 22.47 acres are to be assessed as other farmland (adding the acres in other farmland, grass waterways and windbreaks, and farm buildings), and 10.25 acres as permanent pasture.

Subtracting the 46.48 noncropland acres from the 320 acres in the example farm results in 273.52 acres of cropland. This figure is entered on line 7 of the example worksheet.

Noncropland and Cropland Acreage in Parcel

6. Noncropland acreage	
A. Acres in permanent pasture	10.25
B. Acres in other farmland (includes timber and ponds)	17.49
C. Acres in grass waterways and windbreaks	0
D. Acres in farm buildings	4.98
E. Acres in dedicated roads only	6.00
F. Acres in rivers, creeks, streams, and drainage ditches	3.60
G. Acres in wasteland (includes borrow pits)	3.16
H. Homesite acreage	1.00
I. Total noncropland acreage	46.48
7. Cropland acreage, including rotational pasture (line 3 minus line 6I)	273.52

Step Two: Determining Soil Productivity Indexes

In the second step, the local assessing official must calculate a soil productivity index for each major land use. To begin the calculation, the official records the soil mapping unit and associated acreage for each land use and then looks up the appropriate average management soil productivity index for each soil series designated by the units (see Table 1, pages 13-14). As mentioned previously, however, the average management indexes are only for land with 0 to 2 percent slope and uneroded conditions. Using the adjustment factors in Table 2, the local official then adjusts each index to account for the actual slope and erosion conditions on both favorable and unfavorable subsoils (see Table 2, page 15). Multiplying the index by the appropriate factor adjusts for slope and erosion characteristics. Lines 8, 11, and 14 provide space to record the mapping unit, productivity index, adjustment factor, and acreage for cropland, permanent pasture, and other farmland, respectively.

Once the local official has determined the adjusted soil productivity index for each soil series in a farm use category, he or she must weight each adjusted index to reflect that soil's contribution to the use category. The contributions of all the soils in each use category are then summed (lines 9, 12, and 15). This sum is divided by the total acreage of that land use to achieve a weighted soil productivity index for the land use. Line 10 on the worksheet provides space for calculating the weighted index for cropland. Line 13 can be used for computing a weighted soil productivity index for permanent pasture, and line 16 for computing one for other farmland.

The example worksheet (opposite page) shows the data used to determine the weighted index for cropland for the example farm. Note that the worksheet indicates that soil 235 floods three out of every ten years. Because of this flooding, the index of soil 235 was adjusted by .70 [1.00 - (3 ÷ 10)]. Also note that the unfavorable subsoil of soil 91B was taken into account when an adjustment factor was chosen from Table 2. The weighted productivity index for cropland in this tract is shown on line 10 and is the 26,020 total contribution from all soils (line 9B) divided by the 273.52 cropland acres (line 9A), or 95.

In a similar manner, a weighted soil productivity index is computed for permanent pasture and for other farmland. The permanent pasture and other farmland computations for the example farm are shown on the example worksheet (pages 35 and 36). Line 13 indicates that the weighted tract productivity index for permanent pasture in the example farm is 75, while line 16 lists 84 as the weighted index for other farmland.

Calculation of Cropland Weighted Tract Productivity Index (PI)

8. Data for Calculating Total Contribution

Soil No.	PI	X	Adjustment	=	Adjusted PI	X	Acres	=	Contribution
235	97		.70		68		16.65		1,132
23B	82		.99		81		30.64		2,482
440B	110		.99		109		2.88		314
387C3	105		.83		87		35.00		3,045
398A	117		1.00		117		30.50		3,569
194C2	80		.92		74		20.00		1,480
302	105		1.00		105		8.60		903
402	120		1.00		120		48.76		5,851
918	90		1.00		90		80.49		7,244

9. TOTAL — A. 273.52 (should agree with line 7) — B. 26,020

Notes on soils 918 has unfavorable subsoil. 235 floods 3 out of every ten years.

10.

Total contribution (line 9B)	÷	Total acres (line 9A)	=	Weighted tract PI for cropland
26,020		273.52		95

Calculation of Permanent Pasture Weighted Tract Productivity Index (PI)

11. Data for Calculating Total Contribution

Soil No.	PI	X	Adjustment	=	Adjusted PI	X	Acres	=	Contribution
570D2	92		.86		79		2.25		178
194C2	80		.92		74		8.00		592

12. TOTAL — A. 10.25 (should agree with line 6A) — B. 770

Notes on soils None

13.

Total contribution (line 12B)	÷	Total acres (line 12A)	=	Weighted tract PI for permanent pasture
770		10.25		75

Calculation of Other Farmland Weighted Tract Productivity Index (PI)

14. Data for Calculating Total Contribution

Soil No.	PI	X	Adjustment	=	Adjusted PI	X	Acres	=	Contribution
402	120		1.00		120		3.08		370
23B	82		.99		81		10.54		854
194C2	80		.92		74		8.85		655

15. TOTAL A. 22.47 (should agree with line 6B + 6C + 6D) B. 1,879

Notes on soils None

16.

Total contribution (line 15B)	÷	Total acres (line 15A)	=	Weighted tract PI for other farmland
1,879		22.47		84

Step Three: Assessing Each Land Use

The final step is to assess each land use according to the state-certified use valuation (called the equalized assessed value or EAV) for the weighted index calculated in step two and according to the specified level of assessment. It is important to use the EAVs certified for the current assessment year. The values given in this circular in Table 3 are for the 1984 assessment year only and are merely given as an example. Lines 17 through 20 on the worksheet provide space for recording the current year's EAVs for each land use. These can be obtained from the Department of Revenue or your local assessing official.

Once the appropriate EAVs have been determined for each land use, the farmland valuation is accomplished by multiplying the appropriate EAV by the acreage in the parcel dedicated to each use. Lines 21 through 24 provide space for the computations. Notice that any wasteland that contributes to the productivity of the parcel's farmland should be assessed (line 24). According to the Department of Revenue's guidelines, lines 6E, 6F, and 6G are to be assessed as wasteland.

In the example farm, cropland, with its adjusted tract soil productivity index of 95, is assessed at $121 per acre according to the 1984 certified EAVs (Table 3). That value is recorded on line 18 (see opposite page). The EAVs for permanent pasture, with a weighted index of 75, and other farmland, with a weighted index of 84, are found in Table 3 to be $39 and $76, respectively. However, the assessment level for permanent pasture is

one-third the level of comparably productive cropland, and the assessment level for other farmland is one-sixth that of comparably productive cropland. In addition, the assessed level for permanent pasture cannot be below ⅓ of the EAV of the lowest cropland productivity index certified by the state (line 17), and other farmland cannot be below ⅙ of the same EAV. Accordingly, in this example, permanent pasture is assessed at one-third of $39 or $13 per acre (line 19) and other farmland at one-sixth of $76 or $13 per acre (line 20).

Equalized Assessed Values (EAV) for the 19 84 (Current) Assessment Year

17.	19 84 EAV of the lowest cropland PI certified by the state: PI 60 (used as a reference point)	$ 12
18.	19 84 EAV of the weighted tract PI for cropland (line 10)	$ 121
19.	⅓ of the 19 84 EAV of the weighted tract PI for permanent pasture (line 13), but not less than ⅓ of line 17	$ 13
20.	⅙ of the 19 84 EAV of the weighted tract PI for other farmland (line 16), but not less than ⅙ of line 17	$ 13

The valuation of the cropland, permanent pasture, and other farmland in the example farm is shown on lines 21 through 23 of the example worksheet (page 38). It was determined that the 3.16 acres of wasteland (line 6G) contributed nothing to the example farm's agricultural value, but that the 3.6 acres of rivers, creeks, streams, and drainage ditches (line 6F) contributed to the value of adjoining cropland. The assessed value of this wasteland (line 24) is thus one-sixth the EAV of the lowest productivity index of cropland certified (line 17). Dedicated roads (line 6E) carry a zero assessment.

Total Farm Assessment

Items 25 through 28 on the worksheet provide space for a summary of all farm real estate assessments. These entries are totaled on line 29 to give the total farm real estate assessment for the year in question.

For the example farm, the 1984 homesite valuation was $2,000 (line 26); the 1984 farm building valuation was $13,400 (line 27); and the 1984 residence valuation was $10,000 (line 28). The 1984 farmland valuation was determined to be $33,528 by summing the valuations of lines 21 through 24 on line 25. The 1984 total farm real estate assessment for the example farm would thus be $58,928.

Farmland Valuation

21.	Cropland acreage (line 7)	X	EAV (line 18)	=	Cropland valuation	
	273.52		$ 121		$	33,096
22.	Permanent pasture acreage (line 6A)	X	EAV (line 19)	=	Permanent pasture valuation	
	10.25		$ 13		$	133
23.	Other farmland acreage (line 15A)	X	EAV (line 20)	=	Other farmland valuation	
	22.47		$ 13		$	292
24.	Any wasteland acreage (lines 6E, 6F, or 6G) contributing to farmland productivity	X	1/6 of line 17	=	Contributing waste-land valuation	
	3.60		$ 2		$	7

Parcel Valuation

25.	Farmland valuation (add lines 21, 22, 23, and 24)	$ 33,528
26.	Homesite (line 6H) valuation (obtain from local assessor)	$ 2,000
27.	Farm buildings valuation (obtain from local assessor)	$ 13,400
28.	Residence valuation (obtain from local assessor)	$ 10,000

19 84 Total Farm Real Estate Assessment

29.	Add lines 25, 26, 27, and 28	$ 58,928

APPENDIX A
Farm Assessment Worksheet
19 ____ Assessment Year

Date _____

County _____

1. Township or road district _____
2. Permanent parcel number _____
3. Acreage from deed _____
4. Name (from tax bill) _____
5. 19 ____ (last previous) assessed value by assessing officials:
   - A. Farmland $ _____
   - B. Homesite $ _____
   - C. Residence $ _____
   - D. Farm buildings $ _____
   - E. Total $ _____

Noncropland and Cropland Acreage in Parcel

6. Noncropland acreage
   - A. Acres in permanent pasture _____
   - B. Acres in other farmland (includes timber and ponds) _____
   - C. Acres in grass waterways and windbreaks _____
   - D. Acres in farm buildings _____
   - E. Acres in dedicated roads only _____
   - F. Acres in rivers, creeks, streams, and drainage ditches _____

G. Acres in wasteland (includes borrow pits) _____

H. Homesite acreage _____

I. Total noncropland acreage _____

7. Cropland acreage, including rotational pasture (line 3 minus line 6I) _____

Calculation of Cropland Weighted Tract Productivity Index (PI)

8. Data for Calculating Total Contribution

Soil No.	PI	X	Adjustment	=	Adjusted PI	X	Acres	=	Contribution

9. TOTAL A. _____ (should agree with line 7) B. _____

Notes on soils _____

10. Total contribution (line 9B) ÷ Total acres (line 9A) = Weighted tract PI for cropland

_____ _____ _____

Calculation of Permanent Pasture Weighted Tract Productivity Index (PI)

11. Data for Calculating Total Contribution

Soil No.	PI	X	Adjust-ment	=	Adjusted PI	X	Acres	=	Contribution

12. TOTAL A. _____ (should agree with line 6A) B. _____

Notes on soils _____

13. Total contribution (line 12B) ÷ Total acres (line 12A) = Weighted tract PI for permanent pasture

_____ _____ _____

Calculation of Other Farmland Weighted Tract Productivity Index (PI)

14. Data for Calculating Total Contribution

Soil No.	PI	X	Adjust-ment	=	Adjusted PI	X	Acres	=	Contribution

14. _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

15. TOTAL A. _____ B. _____
(should agree with line 6B + 6C + 6D)

Notes on soils _____

_____

16.

Total contribution (line 15B)	÷	Total acres (line 15A)	=	Weighted tract PI for other farmland
_____		_____		_____

Equalized Assessed Values (EAV) for the 19 ____ (Current) Assessment Year

17. 19 ____ EAV of the lowest cropland PI certified by the state: PI 60 (used as a reference point) $ _____

18. 19 ____ EAV of the weighted tract PI for cropland (line 10) $ _____

19. $^1/_3$ of the 19 ____ EAV of the weighted tract PI for permanent pasture (line 13), but not less than $^1/_3$ of line 17 $ _____

20. $^1/_6$ of the 19 ____ EAV of the weighted tract PI for other farmland (line 16), but not less than $^1/_6$ of line 17 $ _____

Farmland Valuation

21.

Cropland acreage (line 7)	X	EAV (line 18)	=	Cropland valuation
_____		$ _____		$ _____

22.	Permanent pasture acreage (line 6A)	X	EAV (line 19)	=	Permanent pasture valuation	
	_____		$ _____		$ _____	
23.	Other farmland acreage (line 15A)	X	EAV (line 20)	=	Other farmland valuation	
	_____		$ _____		$ _____	
24.	Any wasteland acreage (lines 6E, 6F, or 6G) contributing to farmland productivity	X	1/6 of line 17	=	Contributing waste-land valuation	
	_____		$ _____		$ _____	

Parcel Valuation

25.	Farmland valuation (add lines 21, 22, 23, and 24)	$ _____
26.	Homesite (line 6H) valuation (obtain from local assessor)	$ _____
27.	Farm buildings valuation (obtain from local assessor)	$ _____
28.	Residence valuation (obtain from local assessor)	$ _____

19 ____ Total Farm Real Estate Assessment

29.	Add lines 25, 26, 27, and 28	$ _____

APPENDIX B
Assessing Farmland Using a Soil Association Map

If a Soil Conservation Service (SCS) soil survey map is not available for a county, additional steps must be taken in the assessment procedure to determine the type and amount of soils as well as the slope and erosion characteristics of a parcel. In this determination, soil association maps play a large role.

A soil association is a grouping of individual soils that are generally found together. A soil association map is a small scale map of the county (usually on one page) showing the county and section boundaries and the soil association boundaries.

A soil association map is thus much less detailed and less accurate than the complete SCS survey. This generality does not make the soil association map useless, but it does mean that the local assessing official must do additional analysis to determine which and how much of each soil exists in a parcel. This additional analysis consists of Steps 1 through 5 below.* Once these steps have been completed, the official can then continue with Steps 1 through 3 outlined in the text.

Step 1. Secure the following publications and maps:

- Aerial Base Tax Maps
- Soil Association Maps. These are available from the Soil Conservation Service, except for the nine counties in which one has never been conducted [see last two paragraphs of this appendix for what to do for these counties]. The soil association maps will show the soil types most likely to be found in the county or in a particular area of the county. This is not exacting information, only an indication and basis for the remainder of the analysis. The soil association maps also give the physical characteristics and sometimes the percentage of the soils in each association.
- Other Aerial Base Photographs from the Soil Conservation Service or Regional Planning Commission. Aerial photographs will indicate differences in soil color and assist in determining the land use category. In addition, the Agricultural Stabilization and Conservation Service in each county has available color aerial slides, which are taken each year.

*Steps 1 through 5 are taken from the Illinois Department of Revenue's *Illinois Real Property Appraisal Manual*, Springfield, Illinois, December, 1982, pages F9 and F10.

- Topographic Maps. Topographic maps are available from the State Geological Survey, Natural Resources Building, Urbana, Illinois 61801. These maps are useful in slope determination and also show higher and lower areas often corresponding to soil type variations.
- Plat Book. Plat books can be obtained through the Farm Bureau. This book will pictorially show ownership and approximate property boundaries. Also road, creek, and river locations are shown.
- Previously Mapped Farms. The SCS has on file complete soil surveys for all parcels that have been surveyed on an individual basis. This information allows the assessing official to have detailed information on some parcels and to relate that information to surrounding parcels.
- Soil Survey Interpretation. The Soil Conservation Service has detailed descriptions of each soil type present in the county. These can be most helpful in matching field observations to the soil characteristics listed in the interpretation. Information is given as to location, slope, color, and texture, along with a more detailed analysis and management recommendations.
- Road Widths. The county highway department can provide the width of roads and information on from where the land was taken. Information on state highways is available from State of Illinois District Highway Offices. This knowledge is needed if tax maps are not available to determine the acreage to be assessed as roads.
- Property Record Cards. The property record card lists the legal description and acreage contained in each parcel.
- *Soil Type Acreages for Illinois.* This publication is University of Illinois Agricultural Experiment Station Bulletin 735. This bulletin lists the soil types present in each county, the area covered by each soil type and the percent of the county each comprises. This is useful in determining the relative probability of finding certain soils in the county.
- Flood Plain Maps and Drainage District Maps. Flood plain maps are available in many counties from county or regional planning commissions. Drainage district maps are available from the drainage district offices. These maps are useful in determining the probability of overflow and the location of drainage ditches and drainage canals.

- Old Soil Maps. Soil maps produced during the early part of the century are available for many counties. Although these maps are more general than detailed soil surveys, they are still useful in delineating some soil boundaries.

Step 2. After these suggested maps and publications are obtained, review each to obtain an understanding of how this material can be used in the location of soil types.

Step 3. Taking the information for a small area (one to several sections of land), review the information on the characteristics of the soils expected to be found in the area.

Step 4. Make a field inspection of each parcel. Generally, this can be made from public rights-of-way. In the field, the information reviewed in Step No. 3 is correlated to the physical characteristics (color, slope, wetness or dryness, erosion, etc.) of the soils observed. A decision is made in the field as to the soil types present and these are delineated on an aerial photograph. Variations in slope and erosion should also be recorded at this time. Boundaries of land use should also be outlined and labeled during the field inspection.

Step 5. Review the soil delineation in the office using the aerial photographs, topographic maps, and maps of previously surveyed farms. If any questions arise, another field inspection may be necessary.

Once the soils have been delineated using the above method, a fairly accurate soil map will have been made. Although this map cannot compare to a complete soil survey, it will be much more accurate than the soil association map if the above method is followed with diligence and consistency.

In the event that no soil association map or complete soil survey is available, the determination of soil types on a parcel is only slightly more difficult than the soil association method just outlined. In this case, all of the available maps and publications listed in Step No. 1 should be obtained.

The best source to use to correlate the soil types with their physical characteristics will be the maps of those farms for which a complete soil survey has been made. Using these soil surveys, aerial photographs, and field inspections of as many of the surveyed farms as necessary, it will become apparent where in the county or township various soils are located and their respective physical characteristics. This study, along with topographic maps and other information sources, will yield conclusions of which soil types exist in a tract and the boundaries of these soil types.

APPENDIX C
Alphabetical Index to Illinois Soil Series Numbers

Urbana, Illinois *December, 1983*
Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. WILLIAM R. OSCHWALD, *Director,* Cooperative Extension Service, University of Illinois at Urbana-Champaign. The Illinois Cooperative Extension Service provides equal opportunities in programs and employment.

AP82-0035—12-83—CC